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SCIENCE NEWS LETTER

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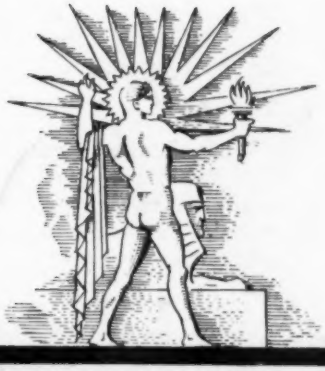
THE WEEKLY SUMMARY OF CURRENT SCIENCE •



September 5, 1942

Young Defiance

See Page 153

A SCIENCE SERVICE PUBLICATION

Do You Know?

Pyrethrum, basis of various insecticides, is made from the dried flower heads of a chrysanthemum species.

First use of poisonous or suffocating *gases* is recorded in 431-404 B.C., when the Spartans burned wood saturated with pitch and sulfur, to drive off enemy Athenians.

Plastic *identification* disks, inscribed with name, birth date, school registration number and home city, have recently been given to 1,600,000 school children in New York City.

Plywood layers are being bonded by *high-frequency waves* in one plant, replacing the common hot press bonding method and shortening production time from hours to minutes.

New plastic tubing for industrial use is chemically resistant, non-corrosive, non-scaling; withstands freezing without bursting, pressure up to 100 pounds, and heat up to 175 degrees Fahrenheit.

In developing aerial *color photography*, now successful at 15,000 feet, huge felt strips of different colors were photographed from planes and the resulting pictures compared with the original felt for color matching.

When the machine shop of a technical high school was given a "sub-contract" to produce *machine parts* for a war plant recently, the results were so highly successful that the program is being expanded.

Soda ash has been successfully used in biological filters, to control odor and acidity in vegetable cannery wastes.

Transparent *plastic splints* for sprained or broken wrists keep the injured part of the arm immobilized, allow free use of fingers, and permit X-raying.

Aluminum sheaths for the knives of packing-house workers are being replaced by sheaths made from scraps of *plexiglas* a transparent plastic, left over from aircraft manufacture.

In the farming of Paraguay the *ox-cart* is the principal mode of transportation.

Although black *pepper* is the most important of all spices in terms of total value and extent of production, it is not grown in the Western Hemisphere.

Domestic *cork* is equal to the Mediterranean product and may be used interchangeably with the imported material, according to results of recent experiments.

Question Box

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Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

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MEDICINE

Fungi Fight Disease

Germ-stopping chemicals obtained from organisms living in earth and manure. Clavicin is germicidal and particularly active against gram-negative germs.

➤ THE GERM vs. germ fight on disease is advanced by two discoveries recently announced (*Science*, Aug. 28).

From a fungus or mold living in the earth and from a fungus in stable manure, two new germ-stopping chemicals have been isolated by Dr. Selman A. Waksman, Dr. Elizabeth S. Horning and Dr. Ernest L. Spencer, of the New Jersey Agricultural Experiment Station and Rutgers University.

The earth fungus chemical is called fumigacin and can be obtained in long, fine needle shaped crystals. The manure fungus chemical is called clavacin. It is particularly active against gram-negative bacteria. Important characteristic of clavacin is its ability not merely to check the growth of bacteria or germs, as other germ chemicals do, but also to kill the bacteria.

Hope of treating diphtheria, tetanus (lockjaw) and other diseases in which the poisons of the germs endanger the patient's life is raised by studies reported by Dr. Erwin Neter, of Children's Hospital and the University of Buffalo School of Medicine.

He tested the action on germ toxins or poisons of a number of germ-stopping chemicals from germs, such as pyocyanase, penicillin, tyrothricin and actinomycin. Pyocyanase, which is brownish black, salve-like material, and Zephiran, a synthetic chemical, he found, inactivate or neutralize the poison of tetanus. Mice given tetanus toxin that has been treated with pyocyanase or Zephiran do not develop lockjaw and die.

Further studies, Dr. Never says, are needed to determine whether the antitoxic properties of these and other germ-chemicals can be used in treatment of disease.

Science News Letter, September 5, 1942

MEDICINE

Sex Hormone "Banks" Used For Relief of Nasal Disease

➤ FEMALE SEX hormone "banks," established by burying pills of sex hormones in the fat over the abdomen, are the latest method of treating the very distressing nasal disease, ozena or atrophic rhinitis. Definite improvement following this treatment in 13 out of 20 women and one of four men is reported by Dr. Lloyd K. Rosenvold, of College of Medical Evangelists (*Archives of Otolaryngology*, June).

Wasting of the lining of the nose with discharge, crusting and foul odor are the symptoms of this disease. Female sex hormone treatment in which the hormone preparation is sprayed or blown into the nose has been used with some success for the past five years, following experiments by scientists in this country, Canada and France.

Applying the hormone preparation directly to the nasal membranes, however, has the disadvantage of requiring frequent and much attention. So when the "bank" method of giving hormone treatment for other diseases was introduced, Dr. Rosenvold saw the possibility of applying it to hormone treatment of ozena. Advantage of the "bank" method is that enough hormone to last for many months can be given at a single operation. Improvement in the ozena patients, Dr. Rosenvold reports, seems to last from four months to almost two years.

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PUBLIC HEALTH

Health Service Checks Twice as Many Diseases

➤ THE U. S. PUBLIC Health Service has doubled the number of communicable diseases on which it keeps tab so as to have an accurate picture of the nation's health each week.

Weekly telegraphic reports from state health officers now include the number of cases of anthrax, amebic dysentery, bacillary dysentery, other unspecified dysenteries, infectious encephalitis (so-called sleeping sickness), leprosy (see p. 151), Rocky Mountain spotted fever, tularemia, and endemic typhus fever.

These nine have been added during the current year to the reports which already included: diphtheria, influenza, measles, meningococcus meningitis, infantile paralysis, scarlet fever, smallpox, typhoid fever and whooping cough.

Previously, reports on the nine newly added weekly reportable diseases had been on a monthly basis and sometimes the reports were considerably late in reaching the federal health service.

Science News Letter, September 5, 1942

"COLLEGE OF AIRPLANE KNOWLEDGE" at the Glenn L. Martin Company teaches plane maintenance to these fledgling grease monkeys. Part of the current class of 500 mechanical doctors to the air forces, are shown learning the intricacies of the Martin B-26 bomber.

PHYSIOLOGY

Energy Transfers Studied

Russian researches on physiology of muscle, conducted while Nazi bombers roared overhead, give useful hint to investigators of disease viruses working in America.

➤ RUSSIANS are aiding American efforts in other fields than those of war.

Basic research in life science, done at the Academy of Sciences in Moscow while Nazi bombers were nightly roaring over the city, has thrown new light on a problem under investigation by a biochemist working in New York. Dr. Kurt G. Stern of the Overly Biochemical Research Foundation told the story at the annual symposium of the Society for the Study of Growth held at North Truro, Mass., when he reviewed present knowledge of how molecules grow and multiply.

Academician W. A. Engelhardt and his Moscow colleagues were trying to find out how muscle fibers used food energy in their contraction. The picture they got was one of a complex phosphorus compound, adenylpyrophosphate, being split by the contractile muscle protein. When they made an artificial model of muscle by spinning threads of muscle protein, much as artificial silk is spun, and immersed it in a solution of the energy rich phosphorus compound, the fibers lengthened. They see a muscle as a spring put under tension in this way. When a suitable stimulus is applied the coil snaps back, the muscle contracts.

This picture, said Dr. Stern, helped him considerably in his efforts to understand the growth and reproduction of the big, protein-like molecules of disease-causing viruses, those ultramicroscopic particles about which there is at present much dispute as to whether or not they are live. Whether they are alive or not, Dr. Stern feels, is of less importance than a determination of the means by which they grow at the expense of their host cells.

One of the things that probably happens when virus particles multiply, Dr. Stern holds, is a piracy of energy from the same kind of phosphorus compound in the host cell by the parasitic virus particles. He suggested therefore that virus growth depends on the appropriation of the host cell's energy supply as well as its building material. This would explain, among other things, why viruses are always parasitic, feeding only on living cells of plants and animals, and are never found as scavengers, feeding on the dead. Dead things might yield them building materials, but could offer no substances actively engaged in the transfer of life energy.

Science News Letter, September 5, 1942

Key to Growth Problems

➤ COLCHICINE, known nowadays primarily for its use in originating new plant varieties, is used by Prof. Edgar Allen and his co-workers at Yale Medical School as a key to new knowledge on animal reproduction, and, incidentally, on the ever-present problem of cancer.

Colchicine is of value in this work, Prof. Allen explained at the meeting of the Society for the Study of Growth, because it "freezes" dividing cells in exactly the condition in which it finds them. Thus he is able to give supplemental doses of sex hormones to female rats and other small laboratory animals, follow that with injections of colchicine, and then kill and dissect his specimens at various time intervals, getting a series of clear pictures of just what has been going on.

One of the things he has found out is that the female sex gland at each reproductive cycle, starts to develop several times as many eggs as it finally discharges. As many as four-fifths of those that start never finish. The colchicine technique shows up the unsuccessful ones, some growing abnormally inside, others developing abnormally outside; the few that are "chosen" maintaining an even developmental balance throughout.

Nobody knows as yet why this happens. If the secret is eventually discovered it will obviously help in giving an understanding of comparative fertility in animals, and thus be of importance in both medicine and farm animal production.

Another discovery made with the aid of colchicine settles the old question of what happens during gestation to the muscles of the uterus, which cradle the young during the pre-birth period. Prof. Allen has definitely demonstrated that these muscles undergo great cell multiplication and growth. After birth, there must be a great dying off and resorption of this emergency tissue, returning the muscles to their ordinary size.

Warning has often been issued by physicians against too free use of female sex hormones in medicine, lest these highly active growth-promoting compounds run growth out of bounds into the wild, anarchic growth that is cancer. Prof. Allen and his colleague, Dr. Willam Gardner have found just that, as a result of long-continued stimulation of growth in the sex organs with hormones. He has slides showing the first experimentally induced cases of cervical cancer in animals. Such cancers cannot be induced in all his animals, but they do arise in from 50% to 62% of the mice that survive hormone treatment for more than one year. Susceptibility seems to be partly a matter of heredity.

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Vegetable "Guinea Pigs"

➤ WHAT PLANTS want for growth, reduced to simplest possible terms by experimenting with separated bits of plant tissue as a kind of vegetable guinea pigs, was described before the annual symposium of the Society for the Study of Growth by Dr. Philip R. White, of the Rockefeller Institute for Medical Research at Princeton, N. J.

Dr. White used three kinds of plant tissue cultures, similar to the chick heart and other animal tissue cultures made famous by the classic studies of Dr. Alexis Carrel. They were detached root-pieces of tomato and other plants, fragments of abnormal tumor-like growths produced by a hybrid tobacco whose parent strains "disagreed with each other" and pieces of crown-gall growth provoked on sunflower stems by bacterial attack.

Plant tissues, it was found, need 11 mineral salts (containing 16 elements), a supply of carbohydrate, three vitamins and one amino acid. Omission of some, like magnesium, calcium or sugar, causes immediate stopping of growth. Lack of others results in slowed-down or abnormal growth.

In the case of the masses of tissue from the tumor-like formations Dr. White found that the oxygen supply had a great deal to do with the kind of growth that would occur. As long as there was plenty of oxygen, they kept on producing cells that were practically all alike growing in no (*Turn to page 156*)

MATHEMATICS

Fall, Jump or Push?

Science solves question whether death was suicide or accident. High speed camera used to study falling body. Mathematics and actual experiments used in method.

➤ A MAN falls off a building. Was it accidental or suicide? An answer has been provided by the scientific investigation of Prof. Rufus Oldenburger, mathematician at the Illinois Institute of Technology in Chicago (*Journal of Applied Physics*, July).

If a man merely loses his balance and falls, the body will first describe a circular arc and then follow the course of a parabola. It will strike some distance out from the building. This distance, for a given height of building, varies somewhat with the height of the man, whether he stood erect or crouched, and whether he gave himself some slight impulse after losing his balance.

Dr. Oldenburger investigated all the ways in which a man, of varying proportions, can accidentally fall off a building—first mathematically, then experimentally.

The experiments were made with sticks of small models which were allowed to fall off a ledge in the laboratory. They were photographed with a camera making 15 exposures per second on the same film, so that position and attitude of the model was shown at successive points of the fall.

Characteristic of the accidental fall is that the body turns end over end while falling. This is due to the initial circular motion which occurs after the man has lost his balance and continues until his feet have left the ledge. This turning continues during the fall and cannot be stopped.

On the other hand, if a man merely steps off a ledge, he will fall nearly vertically. If he walks, runs or jumps off a ledge, he will land farther out than if the fall had been accidental. In none of these cases will there be much if any turning.

By the distance out at which the man lands can be calculated the amount of energy he put into his jump. Dr. Oldenburger further backed up his findings by having young track athletes do some jumping for him. He found that the maximum energy which the strongest of them could put into a jump, made after losing balance, was 100 foot-pounds. If then the calculations show that the man's jump exceeded this energy, it is conclusive evidence that the jump was made before losing his balance, and the verdict is suicide.

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AGRICULTURE

Contour Plowing Brings Changed Fencing Method

➤ CONTOUR PLOWING, following the natural levels of the land to conserve moisture and check soil erosion, is becoming increasingly popular on American farms. Until now, however, the old straight-line fences of the old square-shaped fields have remained, in many instances interfering with the curved path of the cultivating machinery and increasing the number of troublesome "point rows" found necessary.

Some farmers, the U. S. Department of Agriculture notes, have recently begun to reset their fences, so that field boundaries go with the contour plowlines. This not only abates the "point-row" difficulty, but furnishes a permanent guide to cultivation. Plant growth in the fence row also serves as a further water conserver and soil anchor.

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INVENTION

Liquid from Cashew Nuts Makes Varnish Material

➤ CASHEW NUTS, an imported luxury, arrive in shells for which there has been little use. However, the shells contain a liquid that can be converted into good material for varnish and similar uses by means of polymerization, or a chemical welding of its little molecules into bigger ones. A process for doing this has been developed by Solomon Caplan of New York, covered by patent 2,292,611, which is assigned to Harvel Corporation.

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***COMPRESSED AIR** blown down through the top of the hydraulic press under 80 pounds pressure, holds the steel plate above the workman's hand in place until the air is automatically turned off. Then the plate drops into the operator's hand. Developed at Westinghouse, the device has nearly doubled the speed of production of air cleaners for arsenals, Navy laboratories and defense factories. Workmen formerly spent much valuable time in prying each plate loose from the bottom bed of the press.*

NUTRITION

Baby Gets Food Powders

Strained vegetables may be replaced by dried form for duration. Conveniences and ease of shipping expected to increase distribution. Reconstituted with water.

➤ CONVENIENT SMALL cans of of strained vegetables for babies may be out for the duration, but mothers will not be forced to cook and strain the baby's vegetables. Dried, powdered vegetables can be safely substituted for infant feeding, Dr. Reuel A. Benson, professor of pediatrics at New York Medical College, has discovered.

Convenience to American mothers is not the only result expected from Dr. Benson's findings. Babies and small children in war-devastated regions are particularly in need of vegetables in easily digested form. Many more of them will be able to get these foods, because from eight to ten pounds of fresh vegetables are reduced to one pound by dehydration, with consequent saving in shipping space.

Even two-day-old infants can be safely given the powdered, dried vegetables when suitably diluted with water, Dr. Benson announces (*Archives of Pediatrics,* July 24).

Babies under four months of age are usually not given vegetables, even strained ones, because of the difficulty at that young age of swallowing solid foods. Dr. Benson does not recommend routine use of the powdered vegetables for very young infants. The fact that 84 newborn infants were able to take the dehydrated vegetables from the second to tenth day of life without harm shows, however, that they may be safely given to older babies. The powdered, dried vegetables were also given to 34 older infants and 36 older children without any trouble.

The drying process does not appreciably lessen the nourishing value of the vegetables except for loss of anti-scurvy vitamin C.

The dried vegetables may be given in more concentrated form to counteract constipation in infants and children, Dr. Benson discovered. Powdered vegetables may also be useful for allergic children, he suggests, since the process may alter the protein content somewhat as the protein in evaporated milk is altered so that it causes less sensitivity than fluid milk.

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PHILOSOPHY

Brain Power Is Wasted

➤ DUE TO economic barriers that stand in the way of a college education for the abler boys and girls who graduate from high school, America is losing annually the largest portion of the most promising brain power of the nation.

This was charged by Prof. Eli Ginzberg of Columbia University at the Third Annual Conference on Science, Philosophy and Religion held in New York.

"We are oblivious to this one serious shortcoming in our educational system that costs us dearly in progress, both material and spiritual," Prof. Ginzberg said. "For the inventions that will never be made, for the cures that will never be developed, for the art that will never be produced, we have been and are paying a very high price.

"The democracy for which rich and poor, superior and average are laying down their lives can only be brought closer to realization if steps are taken to reform the educational system so that inheritance of brains can cancel out some of the advantages of the inheritance of property."

Although approximately half of all college students are enrolled in institutions supported by public funds, Prof. Ginzberg points out, that fact should not obscure the very serious economic bias in our higher educational structures, as evident from the fact that the college entrance group is composed of approximately one-quarter of the high school graduating classes. But it is not the best quarter when best is defined in terms of intelligence tests and academic achievement. This means, he explained, that most of the able members of the graduating classes fail to go to college, a failure largely based on their lack of economic resources. When one allows for the considerable number of able students who drop out while in college because of economic pressure and further makes allowance for the reduction in academic efficiency of two-thirds of the boys and one-half of the girls who support themselves in whole or in part, he said, the immensity of the bias is placed in perspective.

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INVENTION

Air Transmits the Power From Engine to Propeller

➤ A NOVEL method of transmitting power from engine to propeller in airplanes is proposed by a French inventor, R. P. Pescara of Paris, under patent 2,292,288. The propeller is mounted on the shaft of an air turbine, and the compressed air to drive it is delivered by air compressors directly connected to the pistons of engines embedded in the thick part of the wing. M. Pescara claims that his system solves the problem of changing speeds and eliminates the need for variable-pitch propellers. He has assigned a tenth of his interests to a Swiss Corporation, Societe d'Etudes et de Participations Eau, Gaz, Electricite, Energie, S. A., of Geneva.

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AGRICULTURE

Florida Rice Harvest Success; Extend Plans

➤ RICE-GROWING in southern Florida has proved a decided success, in an experimental planting of 18 acres set out last spring by J. A. Jamison, Martin County superintendent of schools. He has just taken in his harvest, and finds it ran between 50 and 60 bushels to the acre. (See *SNL,* June 13.)

Mr. Jamison, who grew up in the rice country of Arkansas, decided to try rice growing despite skepticism of neighbors, because he hoped to find a good, cheap, locally-raised grain for chicken raisers, who were keeping themselves constantly in the red because they had to purchase most of their feed. So he is distributing most of this year's harvest for seed, and intends to plant 30 acres himself next year.

Rice land is easy to find in Florida. In fact, wet fields and ponds are what most farmers "ain't got nothin' else but." So Mr. Jamison is hopeful for the future of his experiment.

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PUBLIC HEALTH

Leprosy Reported Weekly

➤ WEEKLY REPORTING of leprosy has now been inaugurated by the U. S. Public Health Service. This means that state health officers will include in their weekly telegraphic reports of communicable diseases to the federal health service in Washington any cases of leprosy discovered in their respective states that week.

Actually there are very few cases of this disease in the United States. The total number of new cases reported in 1941 was 49. Nor do the federal health authorities expect any great increase in numbers of cases. They do, however, want to know where the new cases are occurring and especially whether any occur in any of our port cities. Patients with leprosy are excluded from the United States under our quarantine regulations, but the disease in its early stages is very difficult to diagnose so presumably there is always a chance that a patient might come into the country without his disease having been discovered.

The disease is not very "catching" in this country, so there is no reason for great alarm if a patient with leprosy is discovered in a community. In some other countries, such as Hawaii, where it is more prevalent, it also seems to spread much more, especially to young children in families where there is an adult with the disease.

There is a marked tendency toward spontaneous arrest or improvement in leprosy. In Hawaii in one year, about one-fourth of some 500 patients who had been segregated reached the stage of being non-infectious and were allowed to return home. This tendency of leprosy to become arrested spontaneously, while hopeful for the patient, makes it difficult to determine the value of specific treatments. Chaulmoogra oil and its derivatives have been widely used, but after 10 years experience with it in Hawaii, officers of the U. S. Public Health Service concluded it was not of special value and now rarely give it to any except those patients requesting it. For most cases the treatment is like that given to tuberculosis patients in a sanitorium. Local treatment of sores is given as needed and with good care, many of the deformities, such as loss of feet or hands, can be prevented.

The U. S. Public Health Service maintains a National Leprosarium at Carville, La., where patients from any place in the United States may go for the best in modern care of the disease.

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PSYCHOLOGY

Children Think Teachers And Students Like Them

➤ AN OVERWHELMING majority of the school children recently tested believe that their teachers and other adults like them, and that their fellow classmates also like them. Several hundred children, at all school levels, indicated this feeling of security in a survey conducted by the Research Department of the Los Angeles County Schools.

In the primary grades, 81% of all children questioned felt that adults, including their teachers, did like them; at the elementary level (grades 4 to 6) the figure was 63%. Of senior high school students, 88% indicated that their teachers "approved of them."

Another interesting fact brought out by the questionnaire was that over three-fourths of senior high school students felt they held a significant place in the life of their school, while not quite two-thirds felt similarly about their homes.

At all levels the students felt secure in the esteem of their classmates. The figures for primary, elementary, and junior high school levels were 93%, 78% and 84% respectively.

Among the minority group who believe their teachers don't like them, there is evidence that the lack of a feeling of "belonging", or "acceptance" accounts for many personality difficulties. The test emphasizes how important it is for teachers to understand the personal problems of their students.

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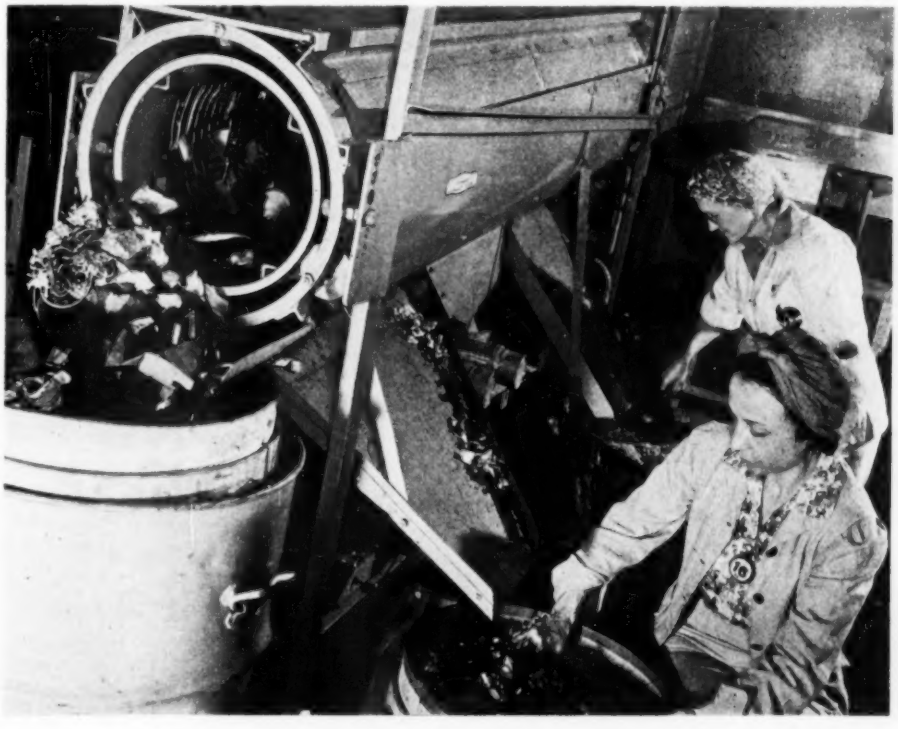
Meat is absent from the diet of three-fourths of India's population, largely because of religious prohibitions.



***WAR METALS** are recovered from floor sweepings by this machine at the Vultee Aircraft Company. First device of its kind to be used in the airplane industry, it is saving some 400,000 pounds a year of small parts and scrap. Gold miners will recognize in this device the same principles that are applied to recover yellow wealth from the gravel of stream beds. Like the useless rubble of the placer beds, refuse is forced out the end of the trommel screen. Various sizes and types of valuable material are shunted into hoppers which are located at the side.*

TECHNOLOGY

Government Plans to Open Dehydrated Food School

➤ TO INSURE production of the highest quality of dehydrated foods for the armed forces of the United Nations, the U. S. Department of Agriculture announces the opening within the next few weeks of the first school to train commercial manufacturers in improved methods of processing developed in government research laboratories. The school is located at Albany, Calif.

Because of the urgent need to conserve shipping space and to prepare foods in a form which will keep indefinitely in any climate, the training program will be expanded sometime this fall to include a school at Rochester, N. Y.

The training program is being jointly conducted by the Agricultural Research Administration and the Agricultural Marketing Administration, which is the lend-lease purchasing agency.

Subjects included in the courses will be selection of vegetable varieties, storage problems, processing, packaging, and laboratory control, to provide maximum quality for this fuel for the fighting men of the United Nations.

Recent improvements in dehydration processes make possible the shipment of dry vegetables, milk, meat, and other foodstuffs, in only a fraction of the space formerly required. Yet when mixed with water at the battle front, they are reconstituted with nearly all the nutrient value and fresh flavor still intact.

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ASTRONOMY

Eclipse Revealed Weather Differences Over World

➤ THE ECLIPSE of the moon on the night of August 25-26 showed that the weather that night was good in the Pacific, at Midway and the Solomons, and bad in Berlin and Russia.

This gives no aid or comfort to our enemies but rather the contrary.

The coppery light which illuminates the moon during a total eclipse, which on this occasion inspired some to say there was blood on the moon, is sunlight which is refracted or bent around the edges of the earth by its atmosphere. Sometimes the earth's shadow is darker and redder than at other times. That means that the skies through which the light passes are overcast or cloudy.

Those who attentively observed the recent eclipse may have noted that during totality the western edge was brighter than the eastern edge until well past the middle of the eclipse.

The brighter light which at midnight EWT illuminated the western edge of the moon, passed through the earth's atmosphere along the mid-Pacific, where the sun was just setting, and indicated clear weather in that region.

The darker light of the eastern edge grazed the earth along eastern Germany and Western Russia and indicated cloudy weather in that region or worse.

Science News Letter, September 5, 1942

INVENTION

New Sight for Firearms Frames Target in Beads

➤ A NOVEL SIGHT for firearms is the subject of patent 2,291,962, granted to John Helfenstein of Bismarck, N. D. Instead of having the conventional vertical front sight that partly covers the target when properly aimed, Mr. Helfenstein has two horizontal beads or points, between which the target is "caught." The rear sight consists of a similar pair of projections, so that when the front sights are completely masked by the rear, and the marksman sees just one pair of points "framing" his target, he has his weapon properly sighted.

Science News Letter, September 5, 1942

RESOURCES

Castor Oil May Be Used To Ease Rubber Shortage

➤ CASTOR OIL, popular remedy for the colic, popular with the mothers not with the babies, may also soothe the pangs of the rubber shortage.

One part castor oil to one part ethyl cellulose is the composition of the new plastic recently announced by the Hercules Powder Company to replace rubber in many of its uses.

The new material has not the bounce of natural rubber, but there are many things for which rubber has been used which do not need bounce, such as washers, gaskets, gloves, galoshes, garden hose, etc. Sixty thousand pounds of rubber have been used in these ways annually, it is estimated, simply because it was cheap and plentiful. For all of them the new plastic is just as good, and in some ways better, they say.

Science News Letter, September 5, 1942

IN SCIEN

INVENTION

Measure Gravity on Lake Bottom in Search for Oil

➤ MEANS FOR making measurements of the force of gravity at the bottom of shallow seas and lakes are described in U. S. patent 2,294,201 awarded to Theodore B. Pepper of Oakmont, Pa., and assigned to Gulf Research & Development Company of Pittsburgh.

Such measurements are made in geophysical prospecting for oil. Since the oil occurs anywhere from a few hundred feet to two miles down, it may very well occur under shallow bodies of water. Measurements cannot be made from a boat because the instrument requires a solid footing and must be leveled with extreme accuracy.

A novel feature of the present device is the provision of a wide flaring skirt at the base of the instrument. Air is pumped from the space between the skirt and the bottom, causing the instrument to be held securely to the bottom. The patent also describes the intricate means by which the leveling and all other adjustments are made by remote control from the boat, and the actual gravity measurements are read from instruments in the boat.

Science News Letter, September 5, 1942

INVENTION

Lamp Gives Both Plain And Ultraviolet Light

➤ A LAMP combination giving both "plain" visible and ultraviolet light is covered by patent 2,291,926, issued to George Sperti of Covington, Ky., and assigned to Science Laboratories, Inc., of Norwood, Ohio. One or more incandescent bulbs provide the visible light, and a tube-like lamp containing mercury vapor gives out the ultraviolet. The glass of the latter lamp is of a type that acts as a filter, to stop the shorter wavelengths that would be harmful on long exposure. The combination is stated to be especially desirable for schools, playrooms and other places where children congregate.

Science News Letter, September 5, 1942

NE FIELDS

ARCHITECTURE

Expert Describes Ideal War Factory and Devices

➤ AN EGG-SHAPED windowless structure of reinforced concrete gives the greatest strength with the least material and saves 60% of the steel ordinarily used, said George H. A. Parkman, Westinghouse construction expert, in presenting his ideas for the ideal war factory.

Such construction would be bomb-resistant and fireproof, he added.

Artificial daylight with the now popular fluorescent lamps and complete air-conditioning, regulating both temperature and humidity to a nicety, would of course be used. A dust precipitator would clean the entering air, and sterilizing lamps would kill its disease germs with their invisible ultraviolet rays.

Continuous, 24 hour a day, power supply would be assured by an intricate network of feed wires and by scattering transformers and protective devices about the plant, so that if one part is destroyed by bomb or sabotage, the rest will continue to function.

Many of these measures have been employed in factories built last year, Mr. Parkman stated, but so far as he knew, none had adopted all of them.

Science News Letter, September 5, 1942

ORNITHOLOGY

Lone Young Marsh Hawk Defies All Intruders

See Front Cover

➤ HAWKS are fierce, even before they have all their feathers. The young marsh hawk pictured on the front cover was found in a nest in an open field on an Indiana farm, and photographed by Rev. John W. Baechle, C.PP.S., professor of biology at St. John's College. There were seven fledglings in the nest when Father Baechle and his friends approached, but six of them scattered, leaving one bold youngster to hold the fort alone. Then the parents appeared, and "we left hurriedly, for we didn't care to tangle with the adults whose young were so scrappy."

Last year, Father Baechle had an uninvited marsh hawk visitor in one of the college classrooms. The bird crashed through a double-strength glass window, with only a slight scratch on its leg to show for its misadventure. It was somewhat dazed, however, so that it was possible to attach an identifying band to its leg before it was released. A month later it was shot by a farmer, about ten miles from the college.

Science News Letter, September 5, 1942

DENTISTRY

Program Is Planned For Attack on Tooth Decay

➤ BANISHING toothaches by a national caries (tooth decay) control program similar to the cancer and tuberculosis control programs is urged by Dr. Oren A. Oliver, president of the American Dental Association.

Dr. Oren's plan for banishing toothaches calls for: 1. A conference of research workers to determine the extent to which tooth decay can be controlled by use of present knowledge; 2. Presentation of a program at conference of all those "who would have the responsibility of aiding" in the program.

Science News Letter, September 5, 1942

INVENTION

New Type Cargo Plane Speeds Transportation

➤ A CARGO PLANE composed of two parts which can be separated, one carrying the engine and wings, the other the cargo, so that the engine part can immediately fly another cargo without waiting for loading or unloading, is the method of speeding up air transport devised by Benjamin C. Scheufele of Philadelphia, for which he has been granted U. S. patent 2,294,003.

The after part of the fuselage carrying the cargo, telescopes into the forward part, the telescoping portions being rather long to secure stiffness. It has its own retractable wheels and the tail assembly folds up, so that it can be towed by automobile or otherwise along the streets precisely to its destination.

By keeping the motive part constantly busy, as the inventor advises, the number of engines and wings required for air transport of freight is reduced. This saves both labor and raw materials needed in the war effort.

Science News Letter, September 5, 1942

GENERAL SCIENCE

Petrified Replica of Arc Formed by Current

➤ LIGHTNING struck a power line at Wooster, O. and the broken wire carrying 22,000 volts fell to the ground. Along 45 feet of the wire as it lay on the ground the brilliant bluish white flames of the electric arc played continually, flaring up more brightly with every lightning flash which produced powerful electric surges in the wire in addition to its own current.

After the storm, long masses of glassy solidified molten sand and rock were found along the ground where the wire had lain. They were shaped like a tree's trunk with short side branches. Where the arc was fiercest the trunk was four inches in diameter and the branches more than an inch in diameter.

This unusual phenomenon was reported by Karl Ver Steeg of the College of Wooster (*Science*, Aug. 21).

Lightning when it strikes in desert sand or on a beach often leaves a fused and petrified replica of itself. These fulgurites as they are called are sometimes several feet in length, but seldom more than two inches in diameter. The one produced by the broken wire and the storm is therefore a record breaker, probably due to the fact that the arcing continued for nearly three hours, while a stroke of lightning lasts but a small fraction of a second.

Fulgurites, a few inches long, have also been produced in the laboratory by causing artificial lightning to strike into a bucket of sand.

Science News Letter, September 5, 1942

SEISMOLOGY

Quake Hits Near Aleutians; Probably No Damage Done

➤ AS THOUGH the earth itself were attempting to shake itself loose from Jap invasion, an earthquake shook the Pacific area southwest of the Aleutians and east of the Kamchatka peninsula on August 23 at 2:35.1 a.m. EWT. The shock was recorded on American seismographs and earthquake messages to Science Service, made available to the U. S. Coast and Geodetic Survey, allowed the determination of its location as nearly 450 miles in a southwesterly direction from Attu Island at the Western end of the Aleutian chain. Unfortunately the quake was centered at sea and probably no damage was done.

Science News Letter, September 5, 1942

NUTRITION

Fuel for Fighters

New processes revolutionize food industry. Helps solve shipping and storage problems. Strange food forms likely on post-war tables.

By GLENN SONNEDECKER

➤ BLASTING FOODS with torrid heat, freezing them in arctic cold, improving and changing them in the laboratory—by these new processes scientists are turning the breadbasket of the nation topsy-turvy to help get fuel to America's most important fighting machines, our men.

Revolutionary changes in the food industry seem certain to have profound effects on American eating habits that will persist even after victory is ours. Millions of men will have new things to eat and new ways of eating them, in camp, on shipboard, and on the battlefield. Added convenience and advantages of new food processes are then likely to result in all sorts of strange food forms turning up in the kitchen of Mrs. America.

Magic of stuffing four gallons of milk into a three-pound paper sack has already received wide publicity. Spraying milk into hyper-heated chambers, most of the 92% of water is gone in a flash and the white snow of nutritious solids drifts down to be collected for shipment overseas. Mixing this product with ordinary water is said to be almost as satisfactory as the more traditional cow to cup method. Better in some respects, as such milk is from tested cattle, and pasteurized to kill the disease germs which may be lurking in milk from home dairies.

Milk Defatted

To prevent rancidity, dried milk is often defatted. In this condition the powder can be stored almost indefinitely in any climate, whether it be subzero cold or tropical heat.

Last year the United States sent nearly 200,000,000 pounds of dried milk to Britain alone. And lend-lease administrators are clamoring for multiplied production in the future.

In order to insure an adequate supply, research is going forward at the point of origin—the cow. WPA is now compiling records on the success of artificial insemination. By this method cattle may be bred from the very best stock without the costly transportation of the prize animals from one place to another.

Possibilities of artificially increasing the flow of milk by administering sex hormones is also being explored.

The butter obtained from milk has always been difficult to supply to armies in the field. A new type of "butter," already shipped overseas, requires no refrigeration and does not melt even when left in the sun at summer heat. Such stability is obtained by adding hydrogenated cottonseed oil to ordinary butter.

Out of the laboratories has marched a continuous parade of new food forms — concentrated, enriched, dehydrated, precooked, quick-frozen, synthetics, and new plant and animal varieties.

Primitive Drying

But primitive men, including the American Indians, have always been dependent on dried foods such as pemmican and parched corn as part of the diet during war. From war to war its importance has steadily increased. Up until the present primitive struggle, however, the food which resulted left much to be desired as far as palatability was concerned.

Modern dehydrated foods have now been developed which compare favorably with the fresh product off the tree, vine, or butcher's table. Grinding and high temperature methods are used which differ from the ordinary food-drying process.

Soups, oysters, meat, potatoes, eggs, lemonade, pumpkins—in fact the whole gamut of the menu list can now be obtained in dry form.

Free flow of these foods to the allied armies is dependent on shipping facilities. Twenty-seven million pounds of potatoes, for example, can be reduced to a shipping weight of three million pounds by dehydration — like pulling two big cargo ships out of thin air.

Some vegetables contain as much as 90% water. Thus it takes about 10 pounds of fresh vegetables to make one pound of dehydrated product. One pound of dried eggs represents the nutritional part of three dozen eggs as harvested from the hens. Plans call for dehydrating 300,000,000 pounds of eggs this year as compared with only 25,000,000 pounds processed in 1939.

Lend-Lease Eggs

More than 17,000,000 five-ounce packages are being sent to England under lend-lease every month plus vast quantities in barrels for commercial use, the U. S. Department of Agriculture announces. These will be used to supplement the British ration of one shell egg per person each month during the winter and four a month in summer.

Great quantities of tin, in addition to transportation and shipping facilities, will also be conserved by the advance of dehydration processes. Perishable foods that formerly had to be carefully canned, are now packed in a variety of fiber and waxed paper cartons.

Dehydration of meat, especially beef,

***PARACHUTE TROOPER** concealed behind enemy lines, pulls ration "K" from his pocket for a full meal. Use of the emergency ration is demonstrated in this official Quartermaster Corps photograph.*

MILK packaged for shipment overseas is reduced to a powder only one-seventh of the original weight as shown in this official photograph from the U. S. Department of Agriculture. Stored in any climate for an indefinite period, every quart of milk can be reconstituted weight for weight in a fresh condition by mixing with water.

is the most recent development. The process shows great promise for the future. Research is continuing.

At present the Army is using millions of pounds of boneless quick-frozen meat. Adoption of this arctic artifice to stymie the meat-spoiling germs is obviously limited to conditions where subzero storage facilities are available. Such boneless beef not only saves much labor in field kitchens, but is pressed into shape for packaging in 50-pound fiber cartons which save around 50% of shipping space, the War Department estimates.

This quick-freezing process for various foods, the same one which has come into vogue for civilian use during the past few years, is especially adaptable for feeding the armed forces stationed in this country.

Improving Bread

All Army bread is now of the "enriched" type, being fortified with components of vitamin B and minerals. Research results announced by the U. S. Department of Agriculture also point a possible way for making this good bread better. The scientist, Karl F. Finney, broke apart various bread flours in the laboratory into their components of starch, gluten, and water-soluble fraction. Then by juggling these combinations he put together synthetic flours and baked test loaves of bread.

Gluten Important

"Just like Mother used to make" from the original flour, was the test result. But in some there was a difference which reemphasizes the importance of gluten as the key to bread quality. These experiments will also improve interpretations of probable baking value of new types of flour, Bureau of Plant Industry officials point out.

Similar "breakdown" tests are regularly conducted at the Subsistence Research Laboratory at the Chicago Quartermaster Depot, to develop the best possible rations for the armed forces.

Flying, riding jeeps and trucks and tanks, as well as marching on its stomach, our modern Army receives the best diet which can be supplied under war conditions.

Fresh foods are used when convenient, quick-frozen foods when available, preserved foods when necessary, dehydrated foods when possible under combat conditions — somehow, no matter the expense, fuel must be furnished the human fighting machines.

With shells screaming, supply lines cut—what then? Emergency rations. Out of his kit, or out of the plane, tank, or troop carrier, the soldier pulls three square meals in a two-pound package. This contains concentrated food so wrapped as to be edible after exposure to jungle heat, arctic cold, vermin, water, poison gas, or other deteriorating influences.

Containing bread, meat, beverage, and dessert or confection for each meal, this constitutes Army ration "K," originally called "parachute ration," since it is used by the paratroopers.

"Pep Pills" Used

Included are the so-called "pep pills" (tablets of quickly utilized dextrose), powdered coffee and powdered lemonade which can be dissolved in water, fortified chocolate bar, "defense biscuits," concentrated bouillon, and even chewing gum—the latter to reduce the consumption of water.

Extensive field tests, under controlled conditions supervised by medical men, showed that after a week on the "K" ration the physical condition of the soldiers was excellent and in many cases even improved.

When engaged in continuous battle with no time for regular eating, the "D" ration carried by the soldier in his pocket will see him through. It consists solely of concentrated chocolate. But in each four-ounce bar there are 600 calories derived from chocolate, sugar, skim milk powder, cocoa fat, oat flour, vanillin, and vitamin B_1. The oat flour helps the bars to remain in good condition in climates ranging from arctic to jungle temperatures.

"C" Is Precooked

Canned field ration "C" employs the modern precooking process. A ration contains three cans of meat and vegetables and three cans of crackers, biscuits, confection, sugar, and soluble coffee. Each unit also contains pieces of hard candy which keep well and have a tart flavor the men prefer to chocolates. All foods in field ration "C" may be eaten hot or cold.

But the success of these scientifically balanced and processed meals for the Army is predicated on adequate supply. This means action on the home front. We in America will be called upon to feed, not only ourselves, but to help

15 different specimens

This unit of "THINGS of science" consists of materials used in America's packaging industry. These are samples of vegetable parchment, stronger wet than dry; of Kimpak which will absorb sixteen times its own weight in moisture; samples of Fancy Box papers; samples of glassine and greaseproof papers; pieces of velour paper, suede-like in texture.

Not only samples are enclosed, but explanations of the processes of making these highly specialized, and in some cases very colorful papers.

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As in all units of THINGS of science, this unit contains specimens of scientific material to be examined, studied, and enjoyed. Museum-style legend cards are supplied for each science object; a brief, clear explanation of the entire contents is included with suggested experiments. This service is under the sponsorship of Science Service, the non-profit institution for the distribution of scientific information.

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Th-11

supply the United Nations, and eventually much of the civilized world—if we are to keep it civilized.

All foods and supplies will need to be conserved. Garbage must consist only of completely unusable material. Former waste is now put to good use if placed in the proper hands.

Victory gardens next year may increase production as plant breeders develop improved varieties of vegetables and experiment with hormones and other strange chemicals, such as colchicine, which so change the plant's heredity as sometimes to produce a super-plant. Animal geneticists are conducting similar research.

With the growing shortage of farm labor, these methods of increasing yield from the same outlay may eventually be of real importance when put on a national scale.

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From Page 148

particular direction. But when any of these irregular lumps happened to sink beneath the surface of the nutrient fluid, thus reducing the oxygen supply, it would begin to develop stems and leaves. Brought up to the air again, it would revert to its original formless condition.

Dr. White expressed the belief that there must be other kinds of plant material that would lend themselves equally well to experiments on growth control, leading eventually to information of value in such widely separated fields of research as the growth of diseased tissue and the growth of crops.

Science News Letter, September 5, 1942

Effects of Plant Germs

➤ DISRUPTING and deadly things done by one kind of germ that invades plant tissues, grimly suggestive of larger-scale invasions with which the world has recently become too familiar, were described by Prof. A. J. Riker, University of Wisconsin plant pathologist, at the symposium of the Society for the Study of Growth.

The germ is known to scientists as *Phytomonas tumefaciens,* and the gnarled and knotty swellings it causes are called crown galls. Crown galls damage any plant on which they occur, and kill many, so that they are one of the really serious sources of loss to agriculture.

When these germs invade plant tissues they do several things. They give off a number of substances, some of which are poisonous or irritating to the host cells. The bacteria are also very greedy of oxygen, leaving the invaded tissues starved for that vitally necessary element. They produce changes in osmotic pressure and thereby cause the cells to swell. In some way they bring about abnormal production of growth-promoting substances such as hormones and vitamins, and they also provoke the concentration of large quantities of foodstuffs at the invaded spots.

Any of these factors could provoke rapid multiplication and growth of cells, Prof. Riker pointed out; it is therefore no wonder that all of them working together bring about wild growth and an anarchic breakdown in the plant's internal economy. The analogy with the invasion of a peaceful and orderly country by a robber horde is uncomfortably suggestive to even an ordinary imagination.

Laboratory experiments with the same bacteria gave dramatic illustration of the old adage, "What's one man's meat is another man's poison." The germs were robbed of their strength by contact with various amino acids, which are the vital building-blocks of proteins needed in the formation of ordinary, healthy cells. This discovery has no practical possibilities as yet, Prof. Riker explained; it is just an interesting bit of information about the enemy, which may at some future date be turned against him.

Science News Letter, September 5, 1942

RESOURCES

Shortages Put New Oils In Home Medicine Chest

➤ A VOLATILE oil obtained from cedar leaves has recently been included in the U. S. Pharmacopoeia to replace imported oil of lavender, a perfume which is no longer available. Persic oil obtained from either peach or apricot kernels, likewise relieves the shortage of expressed oil of almond.

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● RADIO

Saturday, September 12, 1:30 p.m., EWT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. E. F. Kelly, secretary of the American Pharmaceutical Association, will discuss "Pharmacy and the War Effort."

Tuesday, September 8, 7:30 p.m., EWT

Science Clubs of America programs over WRUL, Boston, on 6.04, 9.70 and 11.73 megacycles.

One in a series of regular periods over this short wave station to serve science clubs, particularly in the high schools, throughout the Americas. Have your science group listen in at this time.

EDUCATION

It's Patriotic To Teach

➤ MANY PATRIOTIC school teachers are becoming restless and dissatisfied with their jobs, and looking for more "constructive" war work. But in the judgment of many national leaders, those who are doing a good job of teaching youth are as important to the nation as are the soldiers fighting in the front lines.

In Great Britain this lesson was learned the hard way. Only after an alarming increase in juvenile delinquency, together with a general decline in adolescent morale, did leaders realize the harm done by weakening their educational and recreational institutions.

The morale of a school-age child depends almost entirely on the example set for him every day by those adults closest to him—his parents and his teachers. War has a particularly destructive effect on the teen-age child, but there are many ways in which a sane, well-balanced teacher can counteract this.

The idealistic adolescent is patriotic by nature. He doesn't need to have patriotism forced on him. In particular, he is keenly sensitive to the hypocrisy of such statements as, "It is your patriotic duty to study hard," or "Mow the lawn" or whatever else we happen to want done.

He wants a real explanation of war—what caused it, what part he can take in it, what hope there is in working toward the abolishment of future wars. Otherwise he will naturally conclude that mass killing and cynical disregard of human suffering is the natural way of life.

A confused, defeatist teacher can do irreparable damage to the groping, hopeful adolescent. An attitude of "We'll always have war, so long as we have human nature" can destroy a child's faith in life.

He wants to hear what is being done to rebuild a better society, in which war will be unnecessary because everybody has his human share of the world's goods. He wants to hear about the magnificent dream of the future which has enabled the ordinary people of China and Russia, for instance, to fight almost single-handed against overwhelming odds.

Science News Letter, September 5, 1942

NUTRITION

No Bananas for Babies

➤ BANANAS have become such a staple article of the modern infant's diet that many a young mother may now be running from market to market looking for bananas for baby's supper. The supply of this tropical fruit has grown extremely short since war-caused shipping difficulties are cutting down the imports from Central America.

If bananas were really essential in a baby's diet, however, the mothers themselves would probably not be here worrying over the problem. It is less than a generation since bananas became generally used for babies and many a grandmother has been horrified to see her precious grandchild fed bananas night after night.

Bananas are a nourishing food. They supply minerals and vitamins, carbohydrates and proteins, and a fully ripe banana, well mashed or sieved, can be digested easily by quite young babies.

The nourishment of bananas can be supplied from other foods. If mother is uncertain just how to change baby's diet, she should consult her doctor or the baby's. He will probably tell her to give the baby strained apple, strained apricot, strained pear and perhaps other strained fruits, to supply the vitamins and minerals, and to increase the amount of cereal to make up for the carbohydrate, protein and calories of the banana. How much of the other foods to add in place of bananas depends on the baby's age and condition, and on this also the doctor should be consulted.

Of course, baby himself may object to another food in place of the banana which he has grown to like. The trick is not to force him to take the new food. Try him first on just a little. If he shuts his mouth tight after one taste and shakes or turns his head, wait until the next meal before trying the new food again. With a little patience he can be taught to like the new foods. Mother must not get excited over his refusal, or her tense, uneasy attitude will add to baby's alarm at meeting a new taste.

Science News Letter, September 5, 1942

A BETTER WAY TO TEACH
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TECHNOLOGY

Bomb "Beauty Treatment" Speeded by Spraying

➤ BEAUTY TREATMENT is administered to British bombs in 4.8 seconds. A new spraying machine puts the paint on 5,000 shells in 8 hours, with only three men in attendance. The job formerly required 120 persons working 450 hours. Technicians who formerly devoted their talents to lacquering food cans designed the machine and built it in ten days.

Science News Letter, September 5, 1942

Bananas, one of the world's oldest cultivated crops, were mentioned in Chinese writings of more than 3,000 years ago.

LEARN SPANISH
THE LANGUAGE OF TOMORROW'S BUSINESS
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PLAYING CARDS
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PHILOSOPHY

Teach Slogan Respect

➤ PEOPLE SHOULD be trained to pay respect to such slogans as "freedom" or "democracy" in the way that they pay respect to the flag of the nation or a creed for which they have enthusiasm, Prof. Philipp Frank, Harvard philosopher, declared at the Third Conference on Science, Philosophy and Religion held in New York.

"But people should learn to respect a slogan or a flag only as the symbol of an actual fighting group," he continued, "and to follow the slogan or the flag only when and if it heads the group to which we have vowed allegiance."

The beliefs that slogans contain some "absolute truth" should never be encouraged, Prof. Frank contended. Whenever we start discussing the question of truth, he explained, we have to use the doctrine of the relativity of truth to avoid logical and moral confusion.

"Truth can only be stated in complicated, qualified, relativized language," Prof. Frank said. "But the decision in a fight has to be quick and plain. The inspiring slogans can and must lead our decisions, but they cannot and must not be our guidance in the search for truth.

"Under the slogan, 'freedom', liberal, fascist, and communist forces do their fighting. Therefore, 'fight for freedom' may mean 'fight for any these goals'. If we believe in a statement in which 'freedom' occurs without an operational definition as in an 'absolute truth', we can without effort join the fight on the side of a party we actually dislike.

"The red colored banner is traditionally connected with a specific type of political creed. When the red banner is hoisted, it adds to the inspiration of people who sympathize with this creed. But the sympathizers of this creed should not be misled into the belief that they have to join every fight on the side on which the red banner is displayed."

As an example, Prof. Frank explained that such good experts in propaganda as the founders of the Nazi party, gave to their swastika a red background to use the emotional effect of this color upon large groups of people.

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PHYSIOLOGY

Thick Skin, Not Pigment, May Protect from Sunburn

➤ NOW THAT you have that summer tan, did you ever stop to think why you no longer sunburn?

For a long time even the doctors thought it was due to the increased production of color pigment in the skin, called melanin, which causes "tanning." But some scientists observed that this pigment is located deep in the skin, except in Negroes, where it is distributed more thickly throughout the skin. And most sunburn occurs in the upper layers of the skin, above the protective pigment in the white race.

Recent evidence (*Science*, Aug. 28) suggests that suntanned skin does not sunburn because of a thickening of the corneum, which consists of layers of flattened horny skin cells on the outer surface. Thus upon exposure to the sun, a person gets "thick skinned" on this outer surface, and is protected from the burning rays. This theory is backed up by experiments with albino mice which cannot form the color pigment. When exposed to the sun, the mice also become resistant to burn, Dr. Harold F. Blum and Dr. John S. Kirby-Smith, of the National Cancer Institute report.

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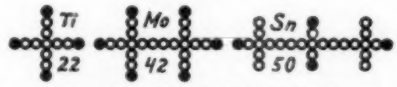
ESSAYS ON THE NEW VORTEX ATOM
VORTEX-ATOM STRUCTURES OF THE HEAVIER ELEMENTS



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Thousands of copies of the "Essays" have already been sent out, and many enthusiastic endorsements have been received, but not a single adverse comment. The supplemental pamphlet on the heavier elements is therefore offered in appreciation of the universally favorable reception which this new vortex-atom theory has been meeting with. Free upon request.

C. F. Krafft, 1322 Amherst Ave., Richmond, Va.

ENGINEERING

Use "Hairy" Planes to Test Streamlining Efficiency

➤ "HAIRY" AIRPLANES may seem in the same class with pink elephants, but they are not. The hairs are not real, however. Bits of string are stuck all over the plane so that engineers may study the direction of air-flow during wind-tunnel tests. Photographs taken during the tests show which way the wind blows and where the streamlining is defective.

Science News Letter, September 5, 1942

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New Machines and Gadgets

⚙ *PERMANENT CREASE in the trousers is now possible as well as a permanent wave in the hair. The crease is maintained by a tape laid along its under side. The edges of this tape are folded inward and are covered with an adhesive which softens with heat so that when the trousers are pressed these edges will adhere to the cloth. The middle portion of the tape then forms a bridge between the two sides of the crease thus preventing the crease from pulling out. This is a recently patented invention.*

Science News Letter, September 5, 1942

⚙ *WELDED INNER TUBES may help the tire situation somewhat. Two or three old tubes, pretty well shot to pieces, may have their good parts cut out and welded together end to end by a special vulcanizing process — and presto, one tube emerges still good for many miles.*

Science News Letter, September 5, 1942

⚙ *NON-STICK WRAPPERS for sticky candies and other sticky products can be made by applying a coating of a new white, odorless, synthetic wax in conjunction with the usual paraffin.*

Science News Letter, September 5, 1942

⚙ *PENCIL CLIP and pencil sharpener are combined in a single device that has been recently patented. When the clip is slid off the pencil, a little blade springs out at the proper angle to sharpen the pencil by the usual twisting motion. Then the device can be closed up and replaced on the pencil as a clip occupying little more space than a regular clip.*

Science News Letter, September 5, 1942

⚙ *HEELS, the kind that women wear, are getting so high that one inventor has proposed a kind of metal frame sky scraper construction for heels which would give greater strength and stability. The heel cannot be broken in two, although it might be bent. At the same time he proposes a transparent covering for the heel so that the beauties of the internal construction will be visible to observant engineers. The only obstacle to the immediate adoption of this patented heel is the critical shortage of metals.*

Science News Letter, September 5, 1942

⚙ *AIRPLANES OF THE FUTURE flying at high altitudes may have their bearings lubricated with metallic vapors instead of the usual oil which becomes gummy at low temperatures. The vapor, which may be that of magnesium, chromium, gold, zinc, lead or, best of all, of barium, is sprayed on the bearing electrically and condenses to a thin soft lubricating film. In the picture scientists are watching a bearing lubricated with barium running at 314 degrees below zero Fahrenheit, in liquid air.*

Science News Letter, September 5, 1942

If you want the sources of the new things described here, send a three-cent stamp to to SCIENCE NEWS LETTER, *1719 N St., N. W., Washington, D. C., and ask for Gadget Bulletin 120.*

PUBLIC HEALTH

Tuberculosis Death Rate Still Declines But Slower

➤ DEATH RATE from tuberculosis in the United States continues to decline, despite an upswing of cases in European countries, it is revealed in a report by the National Tuberculosis Association.

Last year 44 persons died of TB for every 100,000 population, compared with 46 the previous year. This totaled 59,173 persons dead and 105,714 new cases reported.

Despite continued improvement in the death toll, there is slowing up of the downward trend of TB cases in this country. Dr. Kendall Emerson, managing director of the Association, warns that under wartime conditions, tuberculosis may show an increase here, just as it already has in warring countries of Europe.

"Various theories have been offered to explain the increase abroad," Dr. Emerson reports. "Among them are decreased resistance, due to longer hours of work, strain, anxiety, inadequate diet, broken rest, overcrowded homes, and shortages of medical and nursing personnel.

"There is every reason to believe that, as the war goes on, these factors will operate in this country unless voluntary and public health authorities are able to use all of their resources."

Every effort is being made to keep TB out of the armed forces. Army doctors are fully equipped for X-raying and are authorized to reject all those who may have or who have had the disease.

Science News Letter, September 5, 1942

RESOURCES

Increased Use of Wood Bearings May Save Metal

➤ WOODEN BEARINGS may replace metal in many cases where load, speed and temperature are low. In fact, for more than 40 years, bearings of impregnated wood have been used for such things as washing machines, wringers, and rollers for textile machinery. Extension of their use would save metal for war purposes.

Science News Letter, September 5, 1942

Basic Horticulture

By VICTOR R. GARDNER

Consistently maintaining a good balance between fruits, vegetables and ornamentals, this new text for the beginning college course in horticulture thoroughly covers the basic principles underlying the culture of horticultural crops. Current practices are described and explained, and all material, including the illustrative, is so chosen that the text is equally usable in all parts of the country and in all climates. Problems are given at the end of each chapter.

Published July 28th, 441 pp., $3.75

THE MACMILLAN CO.
60 FIFTH AVE., NEW YORK

· New Machines and Gadgets ·

➤ BEAUTIFULLY PRINTED is the most recent of scientific journals, ENDEAVOR, launched by England's great chemical concern (*Imperial Chemical Industries*), to "carry overseas news of the continuing vitality and progress of the sciences, which know no frontiers but are directed to improving the common lot of all men." Other editions are to be printed in Spanish, French and German. Among the contributors to the first number are the late Sir William Bragg, Dr. H. Spencer Jones, Dr. C. H. Waddington, J. G. Crowther, and others.

Science News Letter, September 5, 1942

➤ WE ARE GOING to need much more mathematics for industrial development and research in peace and war—tough mathematics. Such books as MATHEMATICS OF MODERN ENGINEERING by Ernest G. Keller (*Wiley*) the second volume of which has just appeared, serve a useful purpose for those in training in colleges or studying while on the job.

Science News Letter, September 5, 1942

➤ THE PATENT SYSTEM is upheld in PATENTS AND INDUSTRIAL PROGRESS by George E. Folk (*Harper*) who is special patent adviser for the National Association of Manufacturers. Much of the text is from the hearings of the T.N.E.C. relating to patents.

Science News Letter, September 5, 1942

➤ PROBABLY THE LATEST information about vitamins in book form is contained in THE BIOLOGICAL ACTION OF THE VITAMINS, edited by E. A. Evans, Jr., (*Univ. of Chicago.*) Fifteen authorities joined in the symposium.

Science News Letter, September 5, 1942

➤ A GOOD MEDICAL REFERENCE book was produced at a low purchase price when the War Department issued its Technical Manual 8-210, GUIDES TO THERAPY FOR MEDICAL OFFICERS (*Govt. Print. Off.*).

Science News Letter, September 5, 1942

➤ JESSE LEE BENNETT presents in THE DIFFUSION OF SCIENCE (*Johns Hopkins Press*) reasoned, scholarly and thinking consideration of science impacting upon the world as it existed in 1930 before the war, when there was yet time, perhaps. A broad, inclusive picture, philosophically considered, is drawn, and a "World Association for the Diffusion of Science" is the suggested solution. In effect, this is the objective of the popularization of science in press and elsewhere that has been practiced (but not recognized in this book). In times like these the direct, hard-hitting, immediate doing of the job still seems to be the best way.

Science News Letter, September 5, 1942

· Just Off the Press ·

AIRPLANE MODELS AND AVIATION—Willis C. Brown—*Heath*, 43 p., illus., 48 c.

ALONG OUR COAST; STORIES OF SEA CREATURES OF THE PACIFIC OCEAN—Margaret Ripley Miller—*Dodd, Mead*, 60 p., illus., $1.50.

THE A.R.R.L. ANTENNA BOOK—George Grammer and Byron Goodman—*American Radio Relay League*, 142 p., illus., 50 c.

ASTROGRAPHICS; OR FIRST STEPS IN NAVIGATION BY THE STARS, A PRIMER FOR THE AIRMAN CADET—Frank Debenham—*Chemical Publishing Co.*, 118 p., $2.75.

BASIC COLLEGE MATHEMATICS—Carl Wallace Munshower and James Fletcher Wardwell—*Holt*, 612 p., tables, $3.20.

BIRDS ACROSS THE SKY—Florence Page Jaques—*Harper*, 252 p., illus., $2.50.

CALCULUS—G. E. F. Sherwood and Angus E. Taylor—*Prentice-Hall*, 503 p., charts, $3.75.

CASTOR OIL AND QUININE: ONCE A DOCTOR, ALWAYS A DOCTOR—George Wonson Vandegrift—*Dutton*, 252 p., $3.

CHAVIN STONE CARVING—Wendell C. Bennett—*Yale Univ. Press*, 9 p., 30 pls., $1.

CONCRETE WORK—Edward Molloy—*Chemical Publishing Co.*, 140 p., illus., $2.50.

ELECROCHEMISTRY AND ELECTROCHEMICAL ANALYSIS (Vol. III)— Henry J. S. Sand—*Chemical Publishing Co.*, 118 p., $2.50.

ENGINEER'S POCKET BOOK OF TABLES, FORMULAE AND MEMORANDA—F. J. Camm—*Chemical Publishing Co.*, 492 p., illus., $4.25.

ENGINES (Parts IV, V, and VI)—E. Molloy and E. W. Knott, eds.—*Chemical Publishing Co.*, Part IV, 136 p., Part V, 112 p., Part VI, 120 p., all illus., $2.50 each.

ESSENTIALS OF PLANE AND SPHERICAL TRIGONOMETRY—Atherton H. Sprague—*Prentice-Hall*, 169 p., $1.35.

FADING TRAILS, THE STORY OF ENDANGERED AMERICAN WILDLIFE—Committee of U. S. Dept. of Interior, Nat'l Park Service, Nat'l Wildlife Service, Daniel Beard, chairman—*Macmillan*, 279 p., illus., $3.

FIRST AID POPULAR; A BASIC FIRST AID COURSE, A PICTURE SUPPLEMENT TO ALL FIRST AID TEXT-BOOKS—Fritz Kahn—*Krause*, 56 p., illus., 60 c.

FOOD MANUFACTURING—Saul Blumenthal *Chemical Publishing Co.*, 664 p., $7.50.

FOOD PRESERVATION GUIDE—Rosina K. Maxwell—*Bunting Publications*, 264 p., $1.

GAS WARFARE—Alden H. Waitt—*Duell, Sloan and Pearce*, 327 p., $2.75.

GEOPOLOTICS; THE STRUGGLE FOR SPACE AND POWER—Robert Strausz-Hupé—*Putnam*, 287 p., maps, $2.75.

HANDWRITING ANALYSIS—Thea Lewinson and Joseph Zubin—*King's Crown Press*, 147 p., $2.

THE HOME GUARD FIELDCRAFT MANUAL—John Langdon-Davies—*Chemical Publishing Co.*, 169 p., $2.50.

HOW TO REMODEL A HOUSE—J. Ralph Dalzell and Gilbert Townsend—*American Technical Soc.*, 528 p., illus., 10 blueprints, $4.75.

LADY BE FIT! EXERCISES FOR ENERGY, EFFICIENCY AND LASTING HEALTH—Dorothy Nye—*Harper*, 102 p., $1.75.

LESSONS IN PERSONALITY DEVELOPMENT FOR BOYS AND GIRLS—Alice Bergin Blanchette—*Bergin*, 137 p., $2.50.

LIVING MATHEMATICS—G. M. Ruch, F. B. Knight, G. E. Hawkins—*Scott, Foresman and Co.*, 576 p., illus., $1.28.

THE MENTAL GROWTH OF CHILDREN FROM TWO TO FOURTEEN YEARS—Florence Laura Goodenough and Katharine M. Maurer—*Univ. of Minn., Press*, 145 p., $2.50.

NATURAL SINES AND COSINES TO EIGHT DECIMAL PLACES—U. S. Coast and Geodetic Survey—*Govt. Print. Off.*, 541 p., tables, $1.75. Limited number of copies.

NEW LEARNING GUIDE IN BIOLOGY—Elliott R. Downing and Veva M. McAtee—*Lyons and Carnahan*, 319 p., $1.

NEW WORLD HORIZONS—Chester H. Lawrence—*Duell, Sloan and Pearce*, 92 p., illus., $2.75.

NEWPORT TOWER—Philip Ainsworth Means—*Holt*, 365 p., $5.

ON GROWTH AND FORM—Sir D'Arcy Wentworth Thompson—*Macmillan*, 1116 p., illus., $12.50.

ORGANIC SYNTHESIS, AN ANNUAL PUBLICATION OF SATISFACTORY METHODS FOR THE PREPARATION OF ORGANIC CHEMICALS—L. I. Smith—*Wiley*, 114 p., $1.75.

PATENTS AND INDUSTRIAL PROGRESS—George E. Folk—*Harper*, 393 p., $3.

PRACTICAL ACOUSTICS AND PLANNING AGAINST NOISE—Hope Bagenal—*Chemical Publishing Co.*, 140 p., $2.50.

PROCEEDINGS OF THE NATIONAL NUTRITION CONFERENCE FOR DEFENSE—Federal Security Agency—*Gov't. Print. Off.*, 254 p., 35 c.

THE PROSPECTIVE MOTHER—Morris Slemons—*Appleton-Century*, 274 p., $2.50.

SPEECH CORRECTION ON THE CONTRACT PLAN—Ruth B. Manser—*Prentice-Hall*, 381 p., $3.

WASHINGTON, D. C.; A GUIDE TO THE NATION'S CAPITAL (New ed.)—Writers' Program of the Work Projects Administration for the District of Columbia—*Hastings*, 568 p., illus., $3.50.

WORKING WITH RURAL YOUTH—Edmund deS. Brunner—American Youth Commission—*American Council on Education*, 113 p., $1.20.

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